

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of Yoshimitsu SAKAGUCHI, et al.
Application No. : 10/530,199
Confirmation No. : 9605
For : POLYARYLENE ETHER-BASED COMPOUND CONTAINING
SULFONIC GROUP, COMPOSITION CONTAINING SAME,
AND MANUFACTURING METHOD THEREOF
Group Art Unit : 1796
Examiner : TRUONG, Duc
Filed : April 4, 2005
Docket No. : 12477/7
Customer No. : 23838

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. 1.132

SIR:

I, Yoshimitsu Sakaguchi, hereby declare as follows:

1. I have a B.S., a M.S. and a Ph.D. degrees in Macromolecular Science from Osaka University at Osaka, Japan.
2. I am currently employed at Toyobo Co., Ltd. as a Manager of Project E, Corporate Research Center.
3. I have engaged in research and development in the field of Polymer Synthesis for 27 years.
4. I am an inventor for the above-identified patent application; I have read the Office Action mailed October 24, 2008 and the references cited therein, Shigeru (JP 6-279582) and McGrath et al (US 2002/0091225); and I am familiar with the subject matter thereof.

5. I have carried out, supervised and/or directed the conduct of the following experiment and hereby submit my report thereon.

Results of Experimental Demonstration

(1) Test for Endurance Against Hot Water of 110°C

A film (A) using the polymer of the present invention as described in example 3 and two types of films (a) and (b) produced as disclosed in paragraphs [0052]-[0055] of US2002/0091225 were prepared.

Film (A)	S-DCDPS: 38 mol%	Inherent Viscosity: 0.77 dl/g
Film (a)	S-DCDPS: 40 mol%	Inherent Viscosity: 0.67 dl/g
Film (b)	S-DCDPS: 45 mol%	Inherent Viscosity: 0.75 dl/g

The films were immersed in hot water of 110°C for six days. The variation of the films in form was visually observed. Also, an expression of (weight after immersion/weight before immersion)× 100 was used to calculate the percentage of the film that maintained for evaluating the stability against heat and anti-swellability. The results are indicated below:

	Form	Maintained by (%)
Film (A)	Maintained	103
Film (a)	Maintained	98
Film (b)	More or less collapsed	84

(2) Test for Endurance Against High Temperature and High Humidity

Two types of films (A) and (B) using the polymer produced in accordance with the descriptions in example 1 and 3 of the present invention and films (a)-(d) using four types of polymers produced as disclosed in paragraphs [0052]-[0055] of US2002/0091225 were prepared.

Film (A)	S-DCDPS: 38 mol%	Inherent Viscosity: 0.77 dl/g
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Film (B)	S-DCDPS: 44 mol%	Inherent Viscosity: 0.77 dl/g
Film (a)	S-DCDPS: 40 mol%	Inherent Viscosity: 0.67 dl/g
Film (b)	S-DCDPS: 45 mol%	Inherent Viscosity: 0.75 dl/g
Film (c)	S-DCDPS: 50 mol%	Inherent Viscosity: 0.77 dl/g
Film (d)	S-DCDPS: 55 mol%	Inherent Viscosity: 1.09dl/g

The films were autoclaved at 120°C for four hours and at 130°C for four hours. The variation of the films in form was visually observed. Also, an expression of (weight after immersion/weight before immersion)×100 was used to calculate the percentage of the film that maintained for evaluating the stability against heat and anti-swellability. The results are shown below:

	Form	Maintained by (%)
Film (A) (120°C × 4h)	Maintained	92.7
Film (A) (130°C × 4h)	Maintained	91.5
Film (B) (120°C × 4h)	Maintained	90.1
Film (B) (130°C × 4h)	Maintained	87.9
Film (a) (120°C × 4h)	Maintained	100
Film (a) (130°C × 4h)	Fused	96.5
Film (b) (120°C × 4h)	More or less fused	91.6
Film (b) (130°C × 4h)	Fused	42.7
Film (c) (120°C × 4h)	Fused	97.3
Film (c) (130°C × 4h)	Fused	59.3
Film (d) (120°C × 4h)	Fused	93.2
Film (d) (130°C × 4h)	Fused (significantly)	No data

(3) Fenton Reaction Test

The films (A), (b) prepared in accordance with item (2) were immersed in a reaction liquid of 66°C containing 3% H₂O₂ and 4 ppm of Fe²⁺. The variation of the films in form after one hour, two hours and three hours was visually observed. In addition, an expression of (weight after immersion/weight before immersion)×100 was used to calculate the survival rates (%) of the films for evaluating the chemical stability. The

results are shown below:

Film (A) (one hour)

Form: maintained, cinnamon color, flexible

Survival rate (%): 100

Film (A) (two hours)

Form: torn into pieces, cinnamon color, flexible

Survival rate (%): 95

Film (A) (three hours)

flexible
Form: embrittled portion torn into small pieces, cinnamon color, partially

Survival rate (%): 78

Film (b) (one hour)

Form: maintained, cinnamon color, flexible

Survival rate (%): 97

Film (b) (two hours)

Form: film destroyed (in powdery form), cinnamon color

Survival rate (%): 21

Film (b) (three hours)

Form: film destroyed (in powdery form), cinnamon color, devitrified

Survival rate (%): 13

(4) Conclusion

The above experiments demonstrated that the polymers of the claimed invention has superior characteristics in terms of stability against heat, anti-swellability and chemical stability, compared with the polymers of US 2002/0091225.

6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may

jeopardize the validity of the patent or any reexamination certificate issued therefor.

Dated: April 22, 2009

Yoshimitsu Sakaguchi
(Signature of Declarant)

Yoshimitsu Sakaguchi
(Typed Name of Declarant)